1. A composition for use in making commercial products, comprising S-equol.

2. The composition according to Claim 1 wherein the composition is made by isolating S-equol from a racemic mixture of S-equol and R-equol.

3. The composition according to Claim 1, consisting essentially of S-equol.

4. The composition according to Claim 3 wherein the S-equol has an enantiomeric purity of 90% minimum enantiomeric excess (EE).

5. The composition according to Claim 4 wherein the S-equol has an enantiomeric purity of 96% minimum EE.

6. An article of commerce comprising a non-racemic mixture of S-equol and R-equol.

7. The article of commerce according to Claim 6, wherein the non-racemic mixture comprises a ratio of S-equol to R-equol of from about 1:99 to about 49:51.

8. The article of commerce according to Claim 6, wherein the non-racemic mixture comprises a ratio of S-equol to R-equol of from about 51:49 to about 99:1..

9. The article of commerce according to Claim 6 wherein the article of commerce comprises a food.

10. The article of commerce according to Claim 7 wherein the non-racemic mixture of equol is made by mixing a first equol component comprising R-equol, and a second equol component consisting of a mixture of S-equol and R-equol.

11. The article of commerce according to Claim 7 wherein the non-racemic mixture of equol is made by mixing a first equol component comprising S-equol, and a second equol component consisting of a - mixture of S-equol and R-equol

12. A food composition comprising an additive component comprising S-equol.

13. The food composition according to Claim 12, wherein the food comprises, per serving of food, at least about 1 mg, and up to about 300 mg, S-equol.

14. The food composition according to Claim 13, wherein the food comprises, per serving of food, at least about 10 mg, and up to about 200 mg, S-equol.

15. The food composition according to Claim 12, the additive further comprising R-equol to form a non-racemic mixture of S-equol and R-equol.

16. A composition for topical application to skin, comprising S-equol and a vehicle.

17. The composition for topical application to skin according to Claim 16, comprising by weight at least 0.1%, and up to 10%, of S-equol.

18. The composition according to Claim 16 where the S-equol is conjugated at the C-4' or C-7 position to form a conjugate selected from the group consisting of glucuronide, sulfate, acetate, propionate, glucoside, acetyl-glucoside, malonyl-glucoside, and mixtures thereof.

19. The composition for topical application to skin according to Claim 16, further comprising R-equol, to form a non-racemic mixture of S-equol and R-equol.

20. A method of making a composition comprising S-equol, comprising the steps of:

1) providing a first composition comprising an isoflavone capable of being converted to S-equol,

2) culturing the first composition with an organism capable of converting the isoflavone to S-equol, and

3) incubating the cultured composition for a time sufficient to convert a portion of the isoflavone to S-equol.

21. A method according to Claim 20 wherein the isoflavone is selected from the group consisting of daidzein, daidzin, genistein, genistin, formononetin, biochanin A, and peurarin, and mixtures thereof.

22. The method of Claim 20 wherein the organism is selected from the group consisting of *Enterococcus faecalis,* a *Llactobacillus plantarum* strain, *Listeria welshimeri*, a mixed culture of organisms isolated from the intestines of a mammal known to be an 'equol producer', *Bacteriodes fragilis ,Bifidobacterium lactis, Eubactria limosum, Lactobacillus casei, Lactobacillus acidophilous, Lactobacillus delbrueekii, Lactobacillus paracasei, Listeria monocytogenes, Micrococcus luteus, Proprionobacterium freudenreichii, Sacharomyces boulardii, Lactococcus lactis, Enterococcus faecium,* and *Lactobacillus salivarius,* and mixtures thereof.

23. The method of Claim 20 further comprising the step of inactivating the organism.

24. A method of making a composition comprising S-equol, comprising the steps of:

1) providing a first composition comprising an isoflavone capable of being converted to S-equol;

2) combining the first composition with an enzyme selected from the group consisting of: an enzyme that is extracted from a bacterium capable of converting the isoflavone to S-equol, an alpha-glucosidase, a beta-glucosidase, a beta-galactosidase, a gluco-amylase, and a pectinase, and

3) incubating the combined composition for a time sufficient to convert a portion of the isoflavone to S-equol.

25. A method according to Claim 24 wherein the isoflavone is selected from the group consisting of daidzein, daidzin, genistein, genistin, formononetin, biochanin A, and peurarin, and mixtures thereof.

26. A method of making S-equol product, comprising the steps of:

1) providing a composition comprising an equol enantiomer consisting essentially of S-equol, the composition being produced in a biological synthesis from the metabolism of an isoflavone by an organism;

2) extracting S-equol from the composition to form an product comprising S-equol, by an extraction selected from:

a) a solvent extraction, comprising mixing the composition with a low molecular weight alcohol to provide an alcohol to water ratio of at least 40:60 and no more than 95:5, and

b) an aqueous acid extraction, comprising mixing the composition at a pH of between about 4.0 and about 5.5;

3) concentrating the extract to a solids content of about 15% to about 55%;

4) diluting the concentrate to a solids content of about 6% to about 15%; and

5) separating a solid precipitate from the diluted solution; thereby forming the S-equol product.

27. A method of delivering S-equol to a mammal to prevent or treat a disease or associated condition, comprising administering to the mammal a composition comprising S-equol or a conjugated analog thereof.

28. The method according to Claim 27 where the composition is administered in an amount sufficient to produce a transient level of S-equol in the blood plasma of the mammal of at least 5 ng/mL.

29. The method according to Claim 27 where S-equol is conjugated at the C-4'or C-7 position to form a conjugate selected from the group consisting of glucuronide, sulfate, acetate, propionate, glucoside, acetyl-glucoside, malonyl-glucoside, and mixtures thereof.

30. The method according to Claim 27 where the composition is administered to the mammal orally in a dose amount of at least about 1 mg S-equol.

31. The method according to Claim 27 where disease comprises a hormone-dependent disease or condition selected from group consisting of cardiovascular disease, diminished blood vessel quality, lipid disorder, osteopenia, osteoporosis, liver disease, acute ovarian estrogen deficiency, benign breast cancer, breast cancer, benign prostate cancer, prostate cancer, skin cancer, colon cancer, vasomotor disturbances and night sweats associated with ovarian estrogen deficiency, impaired cognition, dementia, and brain disorders manifest as short or long-term memory loss.

32. The method according to Claim 31 wherein the hormone-dependent disease or condition is selected from group consisting of cardiovascular disease, diminished

blood vessel quality, lipid disorder, osteopenia, osteoporosis, liver disease, and acute ovarian estrogen deficiency.

33. The method according to Claim 32 wherein the composition is administered in an amount sufficient to reduce the level of lipids in the blood or serum.

34. The method according to Claim 32 wherein the composition is administered in an amount sufficient to reduce the surrogate markers of bone turnover or prevent bone loss as measured by bone mineral density.

35. The method according to Claim 32 wherein the composition is administered in an amount sufficient to increase bone formation.

36. The method according to Claim 32 wherein the composition is administered in an amount sufficient to prevent osteoporosis and reduce bone fracture.

37. The method according to Claim 31 wherein the hormone-dependent disease or condition is selected from a group consisting of benign breast cancer, breast cancer, benign prostate cancer, prostate cancer, skin cancer, and colon cancer.

38. The method according to Claim 31 wherein the hormone-dependent disease or condition is selected from a group consisting of vasomotor disturbances and night sweats associated with ovarian estrogen deficiency.

39. The method according to Claim 31 wherein the hormone-dependent disease or condition is selected from a group consisting of impaired cognition, dementia, and brain disorders manifest as short or long-term memory loss.

40. The method according to Claim 27 where disease comprises a non-hormone-dependent disease or condition selected from group consisting of inflammatory conditions of the gastrointestinal tract, the prostate, the breast, the skin and bone, and a condition associated with adenomatous polyps and familial polyposis.

41. The method according to Claim 40 wherein the non-hormone-dependent disease or condition is selected from group consisting of a condition associated with adenomatous polyps and familial polyposis.

42. The method according to Claim 40 wherein the non-hormone-dependent disease or condition is selected from group consisting of inflammatory conditions of the gastrointestinal tract, the prostate, the breast, the skin and bone.

43. The method according to Claim 27 wherein the composition is administered as a food or food additive.